

Do Antioxidants Combat Disease?

A Page for Patients From THE WESTERN JOURNAL OF MEDICINE and Your Physician

Why should anyone care about oxidants?

Scientists now think that oxidants may contribute to the two biggest killers in the United States—cancer and heart disease.

What are oxidants?

Oxidants are reactive molecules that bring about chemical changes in other molecules. Some oxidants are free radicals, which are particularly reactive because they have unpaired electrons. As a result, they are unstable. But they can become stable by robbing electrons from other molecules. This breaks important chemical bonds in the robbed molecules, which then become unstable. The cycle continues as the robbed molecules then react with other molecules in a chain reaction.

How can oxidation promote cancer?

Oxidation—robbing a molecule of electrons—can cause a change in the molecule's structure. If that robbed molecule happens to be DNA, the blueprint for every molecule in your body, this can cause mutations, which may lead to cancer.

How can oxidation promote heart disease?

Like DNA, low-density lipoproteins (LDL, the so-called bad cholesterol) can become oxidized. Scientists now think that oxidized LDL makes the fatty plaque in arterial walls bigger and narrows blood vessels. Narrowed blood vessels in the heart (or "coronary artery disease") can cause heart attacks because the heart muscle cannot get enough of the blood it needs to function properly.

How can I protect myself against the damaging effects of oxidants?

The body depends on an extensive network of compounds known as antioxidants to do just that. Antioxidants are generous molecules: they donate their own electrons to oxidants so that the oxidants won't rob other molecules (like DNA). Vitamins such as C and E, β -carotene, and minerals such as selenium, zinc, and manganese all participate in the antioxidant network. But they also may play other

roles in your body. For example, vitamin C helps keep the substances between your cells intact.

How can I improve my body's antioxidant capacity?

The body makes some of its own antioxidants, but gets a large supply from the foods we eat. Dark green, leafy vegetables—like spinach or kale, but not the pale leaves you find in iceberg lettuce—are especially good sources of antioxidants because they have vitamin C, vitamin E, and β -carotene. Vitamin C can be found in high amounts in citrus fruits, but other fruits, tomatoes, and even potatoes also have vitamin C. β -Carotene is present in yellow-orange fruits like cantaloupe and vegetables like squash and carrots. Large amounts of vitamin E can be found in vegetable oils, whole grains, nuts, and seeds.

In addition to eating foods enriched in antioxidants, it is also important to protect yourself against factors that can deplete antioxidants, such as exposure to cigarette smoke or infection.

Why is it good to get antioxidants from the foods I eat? Why not just take a vitamin supplement?

Different antioxidants work in slightly different ways and in different parts of your body, and they all work together to form a network of protection. If one antioxidant is limited, it may limit the entire system. To ensure that you get the proper complement of antioxidants, eat a well-balanced diet rich in fruits, vegetables, and whole grains.

Can vitamin supplements containing antioxidants be bad for me?

Some vitamins and minerals, if taken in high doses, can be dangerous, like any medication. But it is practically impossible to eat enough fruits and vegetables to get an overdose of antioxidants or other important vitamins and minerals that are found in these foods. So eating a variety of fruits and vegetables—which are also naturally low in fat, high in fiber, and cholesterol-free—is the smartest way to get your antioxidants.